

REMARKS

Claims 1, 2, 11, 12, 19-22, and 35-37 have been amended to clarify the invention. Claims 1-37 remain pending.

The Examiner objected to claim 12 for the following informality: in line 3, "to transmit data at both a first upstream channel" should be -to transmit data at both a first upstream channel and a second upstream channel. However, claim 12 has been amended to read "to transmit at a first upstream channel." It is respectfully submitted that claim 12 complies with all formal requirements.

The Examiner rejected claims 1-11, 19-26, 28-29, and 36-37 under 35 U.S.C. §102(b) as being anticipated by Otani (U.S. patent 6,351,469). The Examiner has rejected the remaining claims under 35 U.S.C. §103(a) as being unpatentable over Otani in view of one or more secondary references Eng (U.S. patent 5,963,557), Friedman (U.S. patent 5,949,788), and Data-Over-Cable Service Interface Specification (DOCSIS), Radio Frequency Interface Specification, SP-RFI-I02-971008, Interim Specification, Cable Television Laboratories, 1997 (herein referred to as DOCSIS-1997).

The present invention is directed towards methods, apparatus, and computer readable medium for using or providing multiple channels within a cable modem. Claim 1 is directed towards a method that requires "transmitting a first portion of the upstream data on a first upstream channel from the cable modem" and "transmitting a second portion of the upstream data on a second upstream channel from the cable modem, the second upstream channel differing from the first upstream channel." Claim 1 also requires that "the first upstream channel and the second upstream channel were assigned within a downstream channel received into the cable modem." Claim 36 is directed towards a computer readable medium that has a similar limitation. Claim 11 is directed towards a cable modem and requires that "the multiple upstream channels are assigned within a downstream channel received into the cable modem." Claim 19 is directed towards a head end for receiving upstream data from a cable modem and requires that the head end is "further operable to assign the first upstream channel and the second upstream channel to the cable modem." Claim 20 is another method claim for transmitting upstream data and requires "receiving a downstream signal within a downstream channel into the cable modem, wherein the downstream signal specifies an assignment of a first upstream channel and a second upstream channel." Claim 36 is directed towards a computer readable medium and has a similar limitation. Claim 35 is directed towards a cable modem having a processor configured to "receive a downstream signal within a downstream channel into the cable modem, wherein the

downstream signal specifies an assignment of a first upstream channel and a second upstream channel.”

The primary reference Otani discloses a system having a center device and a number of terminals. Each device has access to two channels, a B channel (for voice) and a C channel (for data). Column 15, lines 48-51. Each device can allocate its own voice (first medium signal) or data (second medium signal) to a particular sub-channel based on idle/busy information. See Column 4, lines 52-58: “center-side channel managing unit 206 (the channel managing unit 408) *allocates* to the second medium signal [which terminates at the center-side second medium terminating unit – lines 33-35] an idle communication channels to be allocated to the first medium signal [which terminates at the center-side first medium terminating unit – lines 30-32] based on the first medium idle/busy information that the center device 101 *itself* stores.”. Also see Column 5, lines 23-43: “terminal-side channel managing unit 212 (the channel managing unit 507) *allocates* to the second medium signal [which terminates at the terminal –side second medium terminating unit – lines 8-9] an idle communication channel among the communication channels to be allocated to the first medium signal [which terminates at the terminal –side first medium terminating unit – lines 5-8] based on the first medium idle/busy information that the terminal 102 *itself* stores.”

This self-allocation is based on a B-ch idle/busy map which indicates which sub-channels are busy. See Figures 11A and 11B and accompanying text at Column 16, lines 33-40. Although the center device does transmit the B-ch idle/busy map to indicate which sub-channels are busy, the center device does not assign channels to the terminal device nor does the terminal device assign channels to the center device. In other words, Otani fails to teach or suggest a method or apparatus for transmitting or configuring multiple upstream channels in a cable modem based on upstream channels assigned in the downstream channel, in the manner claimed in claims 1, 11, 20, 35, 36, and 37. Additionally, Otani fails to teach or suggest a head end that assigns a first and a second upstream channel to a cable modem, in the manner claimed in claim 19. The secondary references also fail to teach or suggest such a limitations. Accordingly, it is respectfully submitted that claims 1, 11, 19, 20, 35, 36, and 37 are patentable over the cited references.

The Examiner’s rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 2-10, 12-18, and 21-34 each depend directly from independent claims 1, 11, or 20 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claims 1, 11, or 20. Further, the dependent claims require additional elements that

when considered in context of the claimed inventions further patentably distinguish the invention from the cited art.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP

A handwritten signature in black ink, appearing to read 'M R Olynick', written in a cursive style.

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APPENDIX: MARKED-UP COPIES OF AMENDED CLAIMS

1. (Amended Once) A method for transmitting upstream data from a cable modem within a cable television plant, the method comprising:

transmitting a first portion of the upstream data on a first upstream channel from the cable modem; and

transmitting a second portion of the upstream data on a second upstream channel from the cable modem, the second upstream channel differing from the first upstream channel,

wherein the first upstream channel and the second upstream channel were assigned within a downstream channel received into the cable modem.

2. (Amended Once) A method as recited in claim 1, further comprising:

obtaining the first upstream channel from information in [a] the downstream channel input to the cable modem; and

obtaining the second upstream channel from the information in the downstream channel input to the cable modem.

11. (Amended Once) A cable modem comprising:

a processor configured to initiate transmission on multiple upstream channels; and

an upstream transmitting component operating in conjunction with the processor and configurable by the processor to transmit data over multiple upstream channels, wherein the multiple upstream channels are assigned within a downstream channel received into the cable modem.

12. (Amended Once) A cable modem as recited in claim 11, wherein the upstream transmitting component includes a first transmitter that is capable of being configured by the processor to transmit data at [both] a first upstream channel and a second transmitter that is capable of being configured by the processor to transmit at a second upstream channel that differs from the first upstream channel if the second upstream channel is available.

19. (Amended Once) A head end for receiving upstream data from a cable modem, comprising a splitter that receives an upstream signal from the cable modem, the upstream signal including a first portion of the upstream data on a first upstream channel and a second portion of the upstream data on a second upstream channel that differs from the first upstream channel, the splitter being arranged to separate the first portion of the upstream data transmitted over the first upstream channel from the second portion of the upstream data transmitted over the second upstream channel for further processing of the separated data, wherein the head end is further operable to assign the first upstream channel and the second upstream channel to the cable modem.

20. (Amended Once) A method of transmitting upstream data from a cable modem over multiple upstream channels within a cable television plant, the method comprising:

receiving a downstream signal within a downstream channel into the cable modem, wherein the downstream signal specifies an assignment of a first upstream channel and a second upstream channel;

configuring the cable modem to transmit over [a] the first upstream channel if the first upstream channel is represented by information within a downstream channel; and

configuring the cable modem to transmit over [a] the second upstream channel [if the second upstream channel is represented by information within the downstream channel and] if the second upstream channel differs from the first upstream channel.

21. (Amended Once) A method as recited in claim 20, further comprising:

determining whether the cable modem is authorized to transmit over multiple upstream channels prior to [obtaining a] configuring the cable modem to transmit over the second upstream channel; and

configuring the cable modem with the second upstream channel only [where] when the cable modem is authorized to transmit over multiple upstream channels.

22. (Amended Once) A method as recited in claim [20] 21, further comprising:

transmitting over a single channel if the cable modem is set up only to transmit over the first upstream channel; and

transmitting over both the first and second upstream channels if the cable modem is set up to transmit over both the first and second upstream channels.

35. (Amended Once) A cable modem comprising:

a first media access controller associated with a first memory portion into which data is written for transmission upstream from the cable modem;

a second media access controller associated with a second memory portion into which data is written for transmission upstream from the cable modem;

a first transmitter coupled with the first media access controller;

a second transmitter coupled with the second media access controller; and

a processor configured to receive a downstream signal within a downstream channel into the cable modem, wherein the downstream signal specifies an assignment of a first upstream channel and a second upstream channel, configure the first transmitter to transmit data over [a] the first upstream channel, configure the second transmitter to transmit data over [a] the second upstream channel that differs from the first upstream channel if the second upstream channel is available, initiate transmission of a first data portion over the first upstream channel by writing to the first memory portion of the first media access controller and initiate transmission of a second data portion over the second upstream channel by writing to the second memory portion of the second media access controller.

36. (Amended Once) A computer readable medium containing programming instruction for transmitting data from a cable modem within a cable television plant, the computer readable medium comprising:

computer readable code for transmitting a first portion of the upstream data on a first upstream channel from the cable modem; and

computer readable code for transmitting a second portion of the upstream data on a second upstream channel from the cable modem, the second upstream channel differing from the first upstream channel,

wherein the first upstream channel and the second upstream channel were assigned within a downstream channel received into the cable modem.

37. (Amended Once) A computer readable medium containing programming instructions for transmitting upstream data from a cable modem over multiple upstream channels within a cable television plant, the computer readable medium comprising:

computer readable code for receiving a downstream signal within a downstream channel into the cable modem, wherein the downstream signal specifies an assignment of a first upstream channel and a second upstream channel;

computer readable code for configuring the cable modem to transmit over a first upstream channel if the first upstream channel is represented by information within a downstream channel; and

computer readable code for configuring the cable modem to transmit over a second upstream channel if the second upstream channel is represented by information within the downstream channel and if the second upstream channel differs from the first upstream channel.